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OFF-FARM AND NONFARM EMPLOYMENT IN THAILAND: A SUMMARY OF KEY RESEARCH RESULTS

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INTRODUCTION

The Rural Off-Farm Employment Assessment Project[1/] in Thailand was designed to provide data and analyses needed to identify and develop projects and policies to assist in the expansion of rural nonfarm employment. The project was conducted over a three-year period beginning in September 1979. Kasetsart University in Bangkok conducted the project with the assistance of the Ohio State University and Michigan State University.

A major component of the project involved the collection and analysis of farm-household data. Data were collected from 424 households in 25 villages for the period beginning February 1980 and ending March 1981. The data included information on the production of farm and nonfarm enterprises and off-farm work. The households reported labor use by week, the use of other resources and production by month, the receipt and repayment of loans by month, and the stock of physical and financial resources at the beginning and end of the survey year.

1/ A publication list is available which lists the papers which describe the project and report the research results summarized in this paper.

A large number of researchers at Kasetsart, Ohio State and Michigan State universities helped conceptualize the research, collect and edit the data, and conduct the analysis. The purpose of this paper is to summarize the findings for several of the main areas of research completed to date. In the interest of space, no references are given to the large number of specific publications where the original results are reported. The readers of this paper should recognize that the efforts of many researchers are responsible for the work summarized here.

PRINCIPLE RESEARCH FINDINGS

Farm-Household Finance

1. Farm-households have complex and heterogeneous patterns of cash and income flows. Much of the cash income received by farm-households comes from nonfarm enterprises and off-farm work. A large share of farm income is derived from the value of own-production consumed in the home. Cash receipts from farm enterprises are frequently quite lumpy and seasonal. Receipts from off-farm work and nonfarm enterprises are somewhat more evenly spread out over the year.
2. At the beginning of the survey year, only 42 percent of the sampled farm-households reported outstanding loans from all sources. Loans from institutional sources

represented 7 percent of the value of loans outstanding. Farmers reported that 50 percent of the amount of funds borrowed were used to purchase assets. The remainder were about equally divided between operating expenses and consumption. Indebtedness was not great relative to the value of assets. Only nine or ten households in the entire sample of 424 farms were potentially insolvent.

3. The farm-households reported only modest amounts of new borrowing during the year. In Chiang Mai, for example, only 22 of the 155 households analyzed borrowed 500[2/] or more per household during the year.

4. Consumption expenses showed great variation during the year. Peak levels of consumption expenditures usually occurred after the wet season harvest when households have greater levels of liquidity and when many of the national religious and other holidays are celebrated.

5. Few households reported holding financial assets at the beginning of the year, and there was little buying and selling of such items during the year. Few households had checking or saving accounts in formal institutions. The total value of all current assets, including financial assets, averaged only 20,000 per household at the beginning of the year. This represents 17 percent of all assets. There was a tendency for many households to experience cash surpluses in many months. Since these

2/ The Thai currency is baht with approximately 20 baht equal to $1.00 in the survey year.

surpluses were not offset by reports of capital purchases, consumption or financial deposits, it must be assumed that cash was accumulating during the year.

6. The above findings suggest that many households would have benefitted by a rural savings mobilization program. There appear to be financial resources in villages that could be mobilized through innovative savings programs. A few experiments by banks to mobilize village savings have produced promising results.

7. The expansion in recent years of rural bank branches has brought financial services much closer to the rural population. Many village residents, however, still do not have easy access to such services. There appears to have been little experimentation in providing low cost services to villages in isolated areas. More analysis is needed to clarify why lenders haven't been more innovative, and the type of incentives, policies and assistance needed to encourage this development.

8. Farmers complain about collateral requirements for obtaining credit. The problem does not seem to be significant for the overall sample because the average ratio of debt to value of land for the sample was only 3 percent. Considering only households with loans, it was 5 percent. However, it is a problem for the landless, for farmers with unclear land titles, and

farmers with small amounts of land. Additional experiments are needed in ways to reduce collateral requirements for households for which this is a problem.

9. Government programs and policies during the past 6 years have resulted in a great expansion of agricultural credit. There are several reasons which suggest that credit is not a serious constraint for most households in the sample:

   a Less than half reported loans from formal sources.

   b. Levels of indebtness (D/A ratio) do not appear to be high.

   c. Informal sources of credit do not seem to be very important in aggregate terms.

   d. There does not appear to be a ready supply of unused, large lumpy investment alternatives available to accelerate agricultural growth. Pumps, tillers, sprayers and other machinery require the largest capital outlays and they seem to have spread rapidly, in areas where they are most profitable, with the existing credit system.

   e. Reallocating household cash flows would appear to permit self-financing a considerable amount of investment.

   f. High levels of loan default (such as occurred in the Philippines), which might prevent a borrower

from obtaining new loans, don't seem to have occurred.

These points suggest that many farmers have unused borrowing capacity, and their most likely constraint is an adequate supply of good investment alternatives that will increase demand for credit.

10. Even though aggregate credit supply may be reasonably adequate, a number of changes in the delivery of financial services to villagers should be considered.

    a. Additional efforts are needed to reduce loan collateral requirements, and substitute group lending, loan guarantees, etc. to reduce lender risk.

    b. Debt repayment capacity should become the chief factor in allocation of credit. Current credit guidelines ignore the importance of cash receipts from nonfarm activities and off-farm work. Estimates of debt repayment capacity should be made based on total cash flow of the household rather than simply farm receipts.

    c. Many rural lenders are not permitted to make loans for nonfarm enterprises even though they provide an important source of income in many villages. The heavy reliance on targeting of loans should be reduced because loan funds for targeted purposes can <u>substitute</u> for household savings in the finance

of nontargeted purposes, and targeted funds frequently can be diverted to other uses. Moving away from targeting will reduce lender costs in policing loan use, and will reduce borrower costs by eliminating the need to hide the real use made of loan funds.

d. Additional experimentation and innovation is needed in making low cost financial services available in villages. Consideration should be given to the creation of provincial banks which may have more inclination to lend up-country than do Bangkok based banks.

e. Greater flexibility is needed in setting interest rates to reflect changes in inflation rates and to cover the risks and costs of making loans to different classes of borrowers.

f. Increased academic and in-service training will be needed for bank staff to meet the objectives of several of these recommendations. Public sector subsidization and organization of this training could produce high social benefits.

g. The costs may always be prohibitive for banks to provide inexpensive, reliable financial services in rural villages because they must always follow complex rules and procedures designed to instill confidence in the country's currency and banking

system. Experiments should be conducted in creating local savings and credit organizations (some variation of credit unions or savings and loan associations found in other countries) owned and managed by the users.

Sources of Farm Household Income and Income Distribution

1. Net household income was divided into the four categories of farm income, nonfarm income, wages, and other sources. These sources represented 35.5, 21.0, 28.5 and 15 percent, respectively, of total net household income. Thus only about one-third of total household income came from farming narrowly defined. The provincial averages for these data showed wide variation: Khon Kaen -- 47, 12, 24 and 19 percent; Roi Et -- 22, 28, 25, 25; Chiang Mai -- 19, 33, 35, 13; and Suphan Buri -- 71, -1, 22, 8.

   These results suggest that previous estimates of household income may have underestimated income earned from sources other than farming. They also show that households engage in a wide variety of economic activities.

2. Average household income varied widely among and within provinces. All sample villages in Suphan Buri had average income above the World Bank poverty line. One out of nine villages in Chiang Mai fell below the

poverty line, along with four out of eight in Khon Kaen and two out of five in Roi Et.

There was no particular pattern between source and level of income. Both the poorest and the richest villages in the sample received most of their income from nonfarm enterprises. Some of the villages which earned most of their income from farming were among the richest villages, while others were among the poorest.

The source of primary income in a village depends on a complex set of factors including farm size, supply of irrigation water, location, access to markets, supplies of raw materials, and historical specialization in selected enterprises.

3. In all regions, there was a tendency for the amount of income received from all sources to rise as total household income rises. There was a tendency for the proportion of income received from farm enterprises to rise relative to other sources as total household income rises. Conversely, the proportion of income received from nonfarm enterprises, wages and other sources falls as total household income rises. Wages and other income are the most important sources for the lowest income households.
4. Farm household income distribution was highly skewed. The 20 percent of the households that earned the highest incomes earned 50 percent or more of the total income

earned by the sample. Conversely, the poorest 20 percent earned 5 percent of the total income or less. The Gini coefficient for the distribution of total household income was 0.44, which is fairly high by Asian standards.

5. The Gini coefficient of farm income alone was a very high level of 0.58, ranging from 0.53 in Suphan Buri to 0.66 in Chiang Mai. Adding nonfarm income to farm income improved the Gini coefficient in some regions and worsened it in others. The addition of wages and other income improved the distribution in all regions.

Employment, Underemployment and Unemployment on Farm-Households

1. The general conclusion which emerges from analysis of the employment data is that of a dynamic pattern of time allocation among enterprises during the year with high levels of labor force participation and a large number of hours worked throughout the year.
2. The farm-household labor force was defined to include all persons 7-65 years of age living in the household regardless of age, health, family relationships or marital status. The labor force was subdivided into three categories: adult males and females (15-65 years), children (7-14), and persons over 65 years of age. Those aged 7-14 represented almost 24 percent of

the household labor force, and those aged 61-65 represented another 2 percent.

3. The definition of economic activities for which hours of work were reported weekly was limited to major categories of work. Excluded were house work, child care, small enterprises like a few chickens or ducks, and general maintenance of buildings, fences and canals. This definition leads to an underestimation of total time spent on production activities and excludes household production which utilizes large amounts of time for women and children. A member of the household was considered to be employed if he/she reported at least one hour of work per week in the month. Thus, persons who worked very small amounts of time were defined as employed rather than unemployed.

4. During the survey year, the average monthly unemployment rate (persons working less than one hour per week during the month) was 6.9 percent for adult males and 9.2 percent for adult females. This rate included persons not working for any reason. An adjusted unemployment rate was estimated by eliminating all unemployed persons who were sick, on holiday, going to school, etc. The average monthly adjusted unemployment rate has 3.8 percent for males and 6.3 percent for females.

   The adjusted unemployment rate varied during the year with the seasonality of major crops. For men, the

rate varied from 1.4 percent in July (peak plowing and planting month for rice) to 8.8 percent in February (dry season). For women, the lowest rate of 1.6 was in December (rice harvest) and the highest rate of 10 percent was in February. The monthly unemployment rates for men were normally lower than for women. The rates for both men and women were lowest in the North and Northeast provinces and highest in Suphan Buri.

5. The distribution of hours worked was analyzed by dividing adult males and females into three categories based on average number of hours worked per week during the month: 1-19 hours, 20-39 hours, and 40 hours and above. The average monthly employment rate (minimum of one hour of work per week per month) was high: 93 percent for adult males, 91 percent for adult females, 66 percent for children and 83 percent for old people.

   The variation in hours worked per week followed seasonal patterns. The percentage of males reporting 40 or more hours of work per week ranged from a low of 28 percent in April to a high of 44 percent in July, November and December. The percentage reporting less than 20 hours ranged from 11 percent in December to 20 percent in April. Seventeen percent of the females reported more than 40 hours of work in April and that percentage rose to 36 percent in December. Conversely, 14 percent reported less than 20 hours in March compared

to 31 percent in October. For children, 58 percent reported at least one hour of work per week in June compared to 77 percent in December. For old persons, 76 percent worked at least one hour per week in June compared to a high of 91 percent in April.

6. The high proportion of adults reporting less than 20 hours of work could imply considerable underemployment. Caution must be used in making this interpretation. First, defining adults as persons aged 15-65 includes some who are too young and others too old to work year round. Second, adults between 20 and 60 years of age may choose to or may have to average out their work hours during the year. They may work over 40 hours per week during periods of peak farm work, then compensate by working less than 40 hours in other weeks. An analysis of average hours worked by a group of persons at one period time obscures this type of averaging process.

The analysis of possible underemployment was approached in a second way. An arbitrary standard of 40 hours per week for males, 30 hours for females and 20 hours for children and old people was utilized to obtain hypothetical levels of full employment to compare with actual hours worked. Actual hours worked reached 85 percent of this standard for the year for the entire sample and exceeded 95 percent in July, August, November and December.

Allocation of Labor Among Economic Activities

1. Household family members allocate their work time among a variety of farm and nonfarm activities. About half of the total hours of work reported by the household labor force was allocated to farm work. The other half was allocated to off-farm work and to nonfarm enterprises. The proportion of total hours allocated to nonfarm and off-farm work was 38, 52, 73 and 24 percent, respectively, in Khon Kaen, Roi Et, Chiang Mai, and Suphan Buri provinces. For the entire sample, the proportion of time spent on farm work exceeded the time spent on other activities only during the four months of July, August, November, and December.
2. Adult males reported 1,650 to 1,800 hours of total work during the year in the North and Northeast, but only a little over 1,000 hours in Suphan Buri. Females reported 1,350 to 1,650 in the North and Northeast compared to 820 in Suphan Buri. Males reported more hours in off-farm work, while females reported more hours on nonfarm enterprises.
3. Most of the hours worked off-farm by both males and females were allocated to nonfarm enterprises. The exceptions were the months of June, July, and December because of the high labor demand in planting and harvesting periods. Off-farm work in nonfarm enterprises was still high in these months, however, so the

primary adjustment was a reduction in hours spent on nonfarm enterprises in the household. Throughout the year, the total number of hours spent per month in off-farm work was less variable than the time spent on nonfarm enterprises.

4. The pattern of time allocation observed above has several possible explanations. First, off-farm enterprises frequently demand a fairly stable labor supply. Nonfarm enterprises in the household, however, are frequently more flexible in their labor demand. Therefore as farm labor demand changes during the year, the time spent in nonfarm enterprises can be adjusted more easily than time spent in off-farm work. Second, males have a comparative advantage in off-farm work because their wages are higher than those for females, so it is logical to find males working off-farm more than females. Furthermore, females tend to have the responsibility of caring for young children, garden plots, and minor enterprises such as pigs, chickens and ducks.

5. Children reported a low of 180 hours of work time per person per year in Suphan Buri and a high of 500 in Khon Kaen. Old persons reported a low of 200 hours per person in Chiang Mai compared to a high of 1,200 in Suphan Buri. Most of the work time of children was spent in farm and nonfarm enterprises, but little was spent in

off-farm work. Old people spent much of their work time in nonfarm enterprises, sometimes even surpassing the time spent on farm work. The total number of hours worked per month and the hours devoted to farming by both children and old people was highest in the planting and harvesting periods.

6. The work time of a sample of Khon Kaen farm households was analyzed by farm size and source of water. The total number of hours worked by males tended to increase with farm size, while it decreased for females. The distribution of work time also changed. As farm size increased, adult males spent more hours on farm work, while the time spent on nonfarm work was roughly the same, but off-farm work sharply declined. For females, farm work was unchanged, nonfarm work declined, and off-farm work sharply declined.

Farm income, nonfarm income and total income went up as farm size increased but off-farm income declined. Households earned more than enough from the extra time spent on farming to compensate for the loss of income which occurred when time was withdrawn from off-farm work.

There was little difference in the total number of hours worked by males, females, and children on irrigated versus rainfed farms. However, there was less month to month variation in hours worked on irrigated

farms, and the pattern of distribution of work time among enterprises was different. Males, females and children spent more time on farm enterprises and less time on nonfarm enterprises on irrigated farms than on rainfed. This was due to more intensive cropping during the dry season on irrigated farms. Compared to rainfed farms, males on irrigated farms spent slightly less time on off-farm work, but females spent slightly more.

Farm income and total income were highest on irrigated farms. Even though rainfed households worked as many total hours, they were unable to increase their income enough from nonfarm enterprises and off-farm work to compensate for lower farm incomes.

7. Labor supply models were used to quantitatively test the factors affecting the time allocation of adult males and females. The analysis showed that households behave rationally with respect to time allocation. The models for off-farm labor supply showed that males and females devote more time to such activities when wages rise. Likewise, they spend less time off-farm when farm earnings and farm size go up. Thus off-farm work and farm work compete for scarce labor. Also as workers get older and as they live farther from urban areas, they spend less time in off-farm work.

The time spent on nonfarm enterprises was harder to explain in the analysis. Higher earnings from these

enterprises do not seem to be associated with more time spent on them. Farm earnings, however, were positively related to time spent working on these enterprises. The reason seems clear. When the household earns more farm income through increased farm size or irrigation, more time is spent on farm work and less off-farm. There is also proportionately more time available in periods of slack farm work which can be spent on nonfarm enterprises. Furthermore even in periods of peak farm labor demand, some time can be spent on nonfarm enterprises when farm work is interrupted due to bad weather or other reasons. Thus farm and nonfarm enterprises are much more complimentary than are farm and off-farm work.

Optimum Enterprise Combination and Allocation of Resources

1. Linear programming models were constructed for the typical farm-household in Khon Kaen and Chiang Mai to test for economic rationality and to predict the impact of simulated changes in resource prices and employment opportunities. The general conclusion was that households allocate resources quite rationally, and there are relatively small gains to be made through resource reallocation among existing enterprises.
2. Average returns to labor followed a fairly consistent pattern. Farm enterprises tend to earn the highest

returns, followed by off-farm work, then nonfarm enterprises. There is a range of labor earnings, however, so there are some farm enterprises that earn less than the average off-farm wage rate. Likewise, some nonfarm enterprises generate returns higher than some farm enterprises and off-farm work.

3. There is a fairly clear division of labor by age and sex for many of the tasks involved in many enterprises. Therefore, one type of labor may be underemployed because of a shortage of another type of labor. In some periods with peak farm labor demand, all household labor is fully employed in farm enterprises. In periods with less demand, labor is allocated to other enterprises.
4. Land is a constraint for small farms because the household utilizes all available land and allocates surplus family labor to nonfarm and off-farm activities. With additional land, more labor is allocated to farming and less to other activities.
5. The Chiang Mai analysis used B1.30 as the net return per hour to nonfarm enterprises. When the rate was simulated at B2.75 per hour, competition between farm and nonfarm work occurred, especially in the dry season. The cropping index fell and the household spent more time on nonfarm enterprises.

The models of Khon Kaen rainfed and irrigated farms showed a response to wage rates. The base off-farm wage

rate was set at B4.48 per hour for men and B3.75 per hour for women, then an increase of 30 percent was simulated. For rainfed farms, there was no effect on farm enterprises but households shifted out of nonfarm enterprises in order to work more off the farm. For irrigated farms, there was a small decline in farm work in the dry season, and an increase in off-farm work and some changes in nonfarm enterprises.

Another Khon Kaen model analyzed the important female enterprises of silkworm raising and silk weaving. The initial off-farm female wage rate was set at B2.75 per hour, then raised to over B3.00. The simulation resulted in a reduction of time spent on the silk enterprises so more time could be spent on off-farm work.

The implication of these analyses is that higher off-farm wage rates could have an impact on dry season farming and work on nonfarm enterprises. There is some level of off-farm wage rate that will tend to reduce the production of both farm and nonfarm products.

6. The Khon Kaen models were used to test the impact of eliminating off-farm work. This simulation caused little change in farm work, but a sharp increase in nonfarm enterprises. Net household income fell sharply, however, because the additional income earned

from nonfarm enterprises could not fully compensate for the loss in off-farm income.

7. These modelling analyses confirmed that a delicate balance occurs in the use of resources, especially family labor, among farm, nonfarm and off-farm activities. Labor allocation patterns are complex as households respond to the labor demands of farm work, and to off-farm employment and wage opportunities. Labor use on nonfarm enterprises adjusts to the changes in demand for farm and off-farm work.

Undoutedly there are nonfarm enterprises that offer potential increases in returns to family labor. Eventually they could become competitive with both farm and off-farm work. But since the timing of work on nonfarm enterprises is frequently more flexible than for other types of work, farm and nonfarm enterprises will tend to be complementary, while farm enterprises and off-farm work will tend to be competitive.

Efficiency of Part-Time and Full-Time Farms

1. Cobb-Douglas production functions were constructed for representative farm households in the North and Northeast to test for possible differences in technical and allocative efficiencies of farmers. The results suggest that the technical efficiency of part-time farms may be slightly lower than full-time farms in both regions.

However, the allocative efficiency results were somewhat mixed. In most cases, farmers tended to over-utilize land, labor, and capital resources, while the results for utilization of other cash expenses were mixed.

Overall, full-time farms in both regions were somewhat closer to optimum allocative efficiency than part-time farms. Full-time farms in the Northeast were much closer to optimum land and labor use than part-time farms, while the opposite results were found in the North. Full-time farms seem to be closer to optimum capital use, while part-time farms seem to be closer to optimum cash expense use.

2. The implication of this analysis is that Thailand may be able to promote dual employment in rural areas without much loss in efficiency in farming. Since both part-time and full-time farms overutilize farm labor, it may be possible to promote the allocation of more labor to off-farm work, while still maintaining satisfactory levels of farm output and efficiency of resource use.

Female Labor Force Participation and Human Fertility

1. Data for married women living with their husbands in 261 households were analyzed to examine female labor force participation and fertility. The general conclusion of this analysis was that an increase in the time allocated by married women to nonfarm, off-farm and domestic cottage activities was associated with a reduction in fertility.

2. The results of cross-tabulation of the data showed:
   a. The number of ever-born children varied with the occupation of the mother. Women in farm occupations had the largest number of births, followed by those working in nonfarm enterprises and in off-farm work, in that order.
   b. As women spend more time in economic activities, fertility increased until a threshold of 2,000 hours worked per year. At this point, fertility began to decrease.
   c. The number of births increased as crop area increased. Landowners had more births than renters.
   d. Families with income greater than B40,000 had an average of more than three children, while those with less income had less children.
   e. A negative relation existed between fertility and the education of husbands and wives.

3. An econometric analysis was used to test these relationships. It showed a negative relation between labor force participation of women and fertility. This analysis also showed a negative relation with land quality, age of women, and age at marriage, but a positive relationship with husband income, labor force participation of children, and land ownership.

4. An econometric model was used to test the relationship between fertility and the time spent by women on nonfarm activities, off-farm work and on cottage industries. The results showed a negative relation with all three types of employment. This analysis also showed a negative relation between household income and fertility.

5. These results suggest that government policies to create rural jobs for women and to increase education and household income would lead to a reduction in family size.